

Economic Techniques of Occupational Health and Safety Management

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Abstract. The article deals with the issues on economic techniques of occupational health and safety management. Authors' definition of safety management is given. It is represented as a task-oriented process to identify, establish and maintain such a state of work environment in which there are no possible effects of hazardous and harmful factors, or their influence does not go beyond certain limits. It was noted that management techniques that are the part of the control mechanism, are divided into administrative, organizational and administrative, social and psychological and economic. The economic management techniques are proposed to be classified depending on the management subject, management object, in relation to an enterprise environment, depending on a control action. Technoeconomic study, feasibility study, planning, financial incentives, preferential crediting of enterprises, pricing, profit sharing and equity, preferential tax treatment for enterprises, economic regulations and standards setting have been distinguished as economic techniques.

1. Introduction

At present, the issues of occupational safety are among the most important for all Russian organizations. In many enterprises, safety issues are more important than economic goals. In this regard, it is appropriate to mention the control system complexities and peculiarities, the influence of motivation and group cohesion on the effectiveness of joint activities [1], including an occupational safety. Here groups can be guided by their own interests or can consider an objective assessment of the economic benefits maximizing due to mutual cooperation [2].

Taking into consideration that all the advanced companies in the world, including Russia, declare in its occupational safety and health protection policy: "People are the main value and the main resource of the company" [3], there is a need to form a special management culture in which the head of each company, managing it as a socio-economic and socio-technical system, must be aware of his role in ensuring occupational safety. However, it is not enough to realize the role you have in this respect. It is necessary to have such management techniques, methods, procedure which will create and ensure the management culture in the field of occupational safety. All this stresses the issue urgency.

2. Problem Statement



Safety, which is relevant to all kinds of economic activities and working process, is an essential part of labour protection. In its turn, labour protection is a “system of life and health preservation of workers in the workplace, including legal, socio-economic, organizational and technical, sanitary and hygienic, medical and preventive, rehabilitation and other measures” [4, 5].

According to Belyaev E.N. [5] labour protection is a system of laws and regulations, organizational and technical, sanitary, economic activities and means ensuring security, health maintaining and workers' performance controlled by Russian legislation basics on labour protection [2, 5, 7].

The important directions in the field of occupational safety are technology improving; the development of new technical tools and technological normative document on occupational safety; socio-economic and organizational issues related to improving occupational safety; evaluation of new equipment and processes in terms of safety [2].

To achieve these goals by any object, whether it is a process, a state or a man, it is necessary to control this object. Taking into account that «occupational safety is the state of working environment in the workplace, where there is no impact of harmful and hazardous production factors on workers or their influence does not exceed the established limits, or there is no unacceptable risk associated with the possibility of workers' health damage [6], it should be managed first of all. This aspect is also mentioned in [8, 9].

The analysis of scientific literature has shown that the issues devoted to the occupational safety management and, in particular, management techniques are not studied enough.

By occupational safety management we mean a task-oriented process to identify, establish and maintain such a state of work environment in which there are no possible effects of hazardous and harmful factors, or their influence does not go beyond certain limits.

The approach in which safety management is considered as a set of tasks, which are divided into organizational, technical, economic, physiological and social is of special interest [9].

In order to the control process can be carried out, you must use the appropriate controlling mechanism. The controlling mechanism is the most active part of the control system, which provides influence on the factors that affect the managed object activity result [10]. By the controlling mechanism is usually meant "a set of system components (the principles, functions, methods, resources), designed to deliver information about managed object to the managerial body and influence the managed object in order to ensure system functioning and development" [11]. Thus, the management techniques are an integral part of the controlling mechanism.

Management techniques are procedures, ways to impact the managed system by the controlling subsystem, in other words - the impact of the management subject on the managed object to achieve the intended goal.

Control methods can be divided into administrative, organizational and administrative, social and psychological and economic ones. Due to the fact that the aim of this paper is to examine the economic techniques of occupational safety management, let us consider all of them in more details.

By the economic management techniques, we mean the subject economic ways to influence the object, which include both economic incentives, and also necessary economic (financial) support.

In order to systematize the idea of economic safety management techniques, we proposed a classification, which is given in Figure 1.

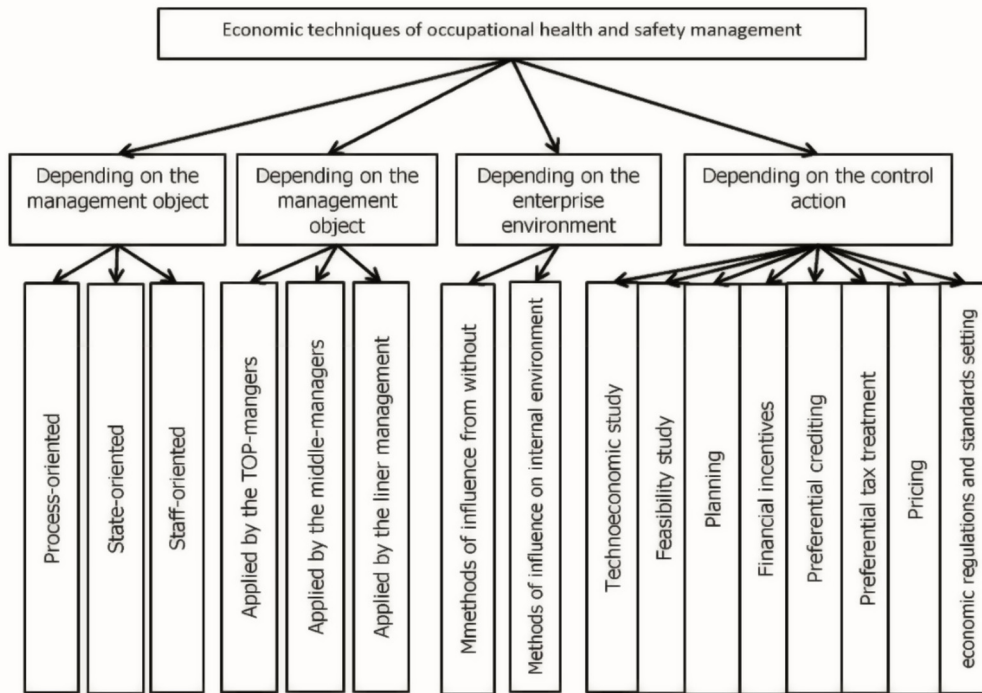


Figure 1. Economic techniques of occupational health and safety management classification

Depending on the objects the economic safety management techniques can be focused on a process, a condition, a staff. Process-oriented methods are related to the need to finance the measures that enhance the safety of the process execution technologies, including the introduction of new, more productive, but also safer equipment. State safety is closely connected with the process safety, in particular, with work environment where there is no impact of harmful and (or) hazardous production factors. Staff-oriented economic techniques are associated with material incentives of safe operation, which generates the proper motivation.

Depending on the relation to an enterprise environment one can distinguish: the methods of influence from without and techniques of the methods on internal environment. The first group of methods involves the creation of special conditions by the government where companies will have benefits providing the necessary level of safety. The second group of methods is based on the company interest to ensure their activity safety. Taking into consideration that this activity requires certain financial expenses, it is necessary to carry out a technoeconomic study and a clear feasibility study to implement the occupational safety project.

Depending on the management subject the methods are classified into: applied by senior managers, by heads of departments and employees.

There are the following major economic techniques of occupational safety management [12-17]:

- technoeconomic study;
- feasibility study;
- planning;
- financial incentives;
- preferential crediting of enterprises;
- pricing;
- profit sharing and equity;
- preferential tax treatment for enterprises
- economic regulations and standards setting.

Due to the fact that the labour security management presented us as a purposeful process, we believe it is appropriate to implement it is sufficient to use a common process approach to management. The process approach is based on the allocation of the aggregate (network system) processes. Understanding of the process gives Figure 2.

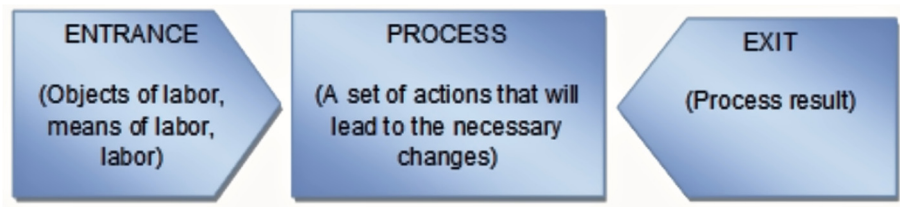


Figure 2. The process of transformation as the “entrance” to the “exit” [7]

In turn, under the safety management process (ESMT) are invited to understand the totality of consistently implemented actions in this area, ordered in time, indicating the beginning – “input” and the end – “exit”, the result of which has a certain value for the consumer. This value, in our case, we assume or absence or reduction of the negative impact of working conditions on the life and health of the employee.

In the process approach to be taken into account the initial state ("input") on the basis of economic management methods of occupational health and safety, the nature (content) control actions, the subject of management, feedback economic methods ("exit"). Keep in mind that the impact of economic control methods must be such that the parameters of the "exit" shall comply with "the consumer". The control mechanism is shown in Figure 3.

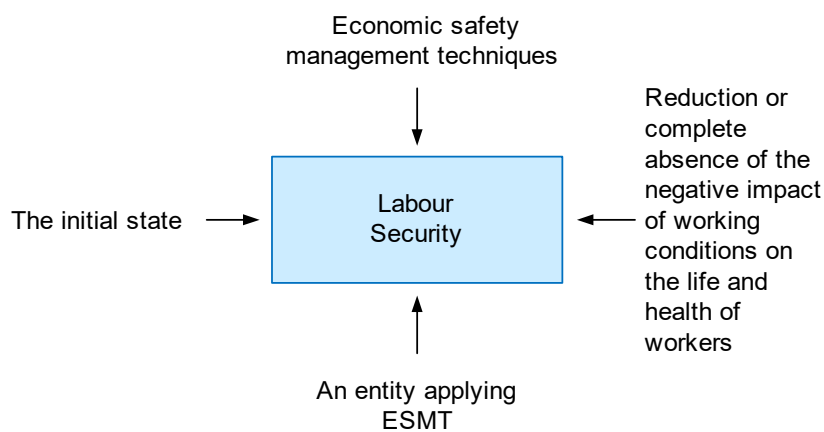


Figure 3. The mechanism of safety management based on economic methods

The effectiveness of safety management process on the basis of economic methods must and can be assessed.

Professor P.I. Sinyov back in the 1930 was asked to assess the safety of working conditions with the help of coefficients of frequency of injuries, the severity of injuries, losses. Disadvantages of these factors are well known. We agree with the opinion noted in S.A. Makzhenov [6] that “the investigation and to be registered has already occurred accidents, leading to a temporary ... or permanent disability or death”.

It has been proposed to include in the estimated performance characteristics that reflect not only the incident occurred, cases of first aid, minor injuries, serious injuries and deaths, but those who are able to demonstrate the company's efforts to prevent them. Part of these metrics can be represented by the coefficients of industrial injuries, occupational diseases and safety, assessed by the number of papers with disabilities and without violations.

The overall efficiency used in the management of economic methods of labour safety (E_{emls}) invited to rely on the formula (1):

$$E_{emls} = \sum g_i \frac{\Delta x_i}{z_i} \quad (1)$$

where g_i – weighting coefficient of the i -th indicator of safety conditions;

Δx_i – the values of the difference of i -index before and after the application of economic methods of safety management;

z_i – for activities costs associated with providing improved value of the i -th index.

Therefore, the proposed model for evaluating the effectiveness of the use of economic safety management methods based on the application of the system of indicators, taking into account the results of management before and after the application of these methods correlated with the costs of their (methods) implementation.

3. Conclusions

In conclusion it should be noted that there is no any universal management technique that can be used in all situations. Achieving occupational safety management goals is possible in the case of complex of technique using, including economic ones, which efficiency can be estimated by following the system, efficiency and effectiveness principles.

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